

# Subject Index

	Page		Page
Abetalipoproteinaemia	120	Catecholamines	6, 25
Absorption		Adrenaline	5, 7, 8
of molecules into gut mucosa	77-78	Co-existence with peptides	2
Horseradish peroxidase	77-78	Dopamine	2 (Table I)
Acetylcholine	2, 21, 25	Noradrenaline	5, 7, 8, 181
Neuronal Distribution	5	Co-existence with acetylcholine	7
Co-existence with ATP	7	Co-existence with ATP	7
Co-existence with noradrenaline	7	Chief cells	159 (Table I)
Acetylcholinesterase	5, 8	Cholecystokinin	2 (Table I), 25
Acinar cells	136 (Fig. 8), 141	Cell	12
Acquired monosaccharide intolerance	73	Granules	15
ACTH		Cholinergic nerves	2 (Fig. 1)
in G cells	28, 29	Acetylcholinesterase and	5
Adenocarcinoma	120 (Fig. 15)	Identification	1, 5
Adenomatosis	130	Cimetidine	155, 169
Adenosine triphosphate	2, 3, 6, 7	Structure	156
Adrenergic nerves	1, 2	Therapeutic use	153
Co-existence with peptides	7, 8	Coeliac disease	49, 51-63, 65, 66, 90, 91, 115, 120, 175
Identification	1, 5	Histology	175
Alkaline phosphatase	72	Immunological features	97-102
Alveolitis	93	Cell-mediated reactions	100-102
Amyloidosis	120	Intestinal permeability	93
Antral Mucosa	157	Polyneuropathy	175
Aeth in G cells	28, 29	Coeliac lesion	87
Effects of H <sub>2</sub> -receptor antagonists	162-165	Colchicine	91
Apoptosis	149, 151 (Table II)	Colon	
Definition	146	S.E.M. features	187
APUD system	8, 141	Changes in diet	187, 188 (Figs. 1-5)
Apudomas	121 et seq	Preparation	187
Argentaffin EC cell carcinoids	31	Composite cells	137, 138, 139 (Figs 9-11)
Argyrophil gastric carcinoids	32	Cow's milk protein intolerance—see cow's milk sensitive enteropathy	
Carcinoid syndrome	32	Cow's milk sensitive enteropathy of childhood	49-51, 50-59 (Figs. 1-9), 56, 58
ECL cell	32, 34 (Fig. 7)	Crohn's disease	38, 39, 66, 93, 100
Gut endocrine tumours	29-31	Zinc and	43-47
Argentaffin carcinoids	29, 31	Crypt cell	
Classification of	30, 31	Proliferation kinetics	89
Duodenal gastrinomas	29	Crypt enteroblasts	66, 67 (Fig. 1)
Non-argentaffin carcinoids	29, 31	D cells	11, 13 (Fig. 2), 17 (Fig. 7), 157, 162, 168 (Fig. 10), 169, 172
L cell tumours	31, 32	Distribution	12
Neurogenic tumours	35	Hyperplasia in duodenal ulcer	172
Pancreatic endocrine tumours	31-35	Hypertrophy in duodenal ulcer	172
Paragangliomas	35	Subclassification	12
Vipomas	34 (Fig. 8), 35	Diabetes	93
Auerbach's plexus	1, 4, 181	Diarrhoea	
Autonomic nerves	11, 181	Polyneuropathy	175
Neurophysiology	181	Watery	175
Peptidergic nerves	6, 21	Diffuse neuroendocrine system	25
Co-existence with ATP	8	Diffusion	
Autoradiography	158, 159, 181	of molecules into gut mucosa	74-77
Kinetic study of proliferative cells	158, 159	Horseradish peroxidase	75, 76-78 (Figs. 13-15)
Basement membrane	90	Ruthenium red	75 (Fig. 12), 76
Lamina densa	90	Disaccharidases	72
Lamina lucida	90	In coeliac disease	72
Biopsy techniques	108	Isomaltase	72
Blind loop syndrome	120	Maltase	72
Bombesin	2 (Table I), 21, 25	Secondary disaccharidase deficiency	72, 73
Bradykinin	2 (Table I)	Sucrase	72
Carcinoma	38	Trehalase	72
Gastric	38, 44, 47		
high jejunal zinc	44		

- |   | Page   |  | Page                                       |
|---|--|--|--|
| Dopamine                                      | 2 (Table I)  | Gastric inhibitory polypeptide                                   | 25   |
| Ductal cells                                  | 141  | Gastric mucosa   | 157  |
| Duodenal mucosa                               | 157  | Effects of $H_2$ -receptor antagonists                           | 159-162                                    |
| Effect of $H_2$ -receptor antagonists         | 165  | Effect of ulcerogenic drugs on pig gastric mucosa                | 79   |
| Goblet cells                                  | 158, 165   | Tubulovesicles   | 157, 159, 160, 161                         |
| Paneth cells                                  | 158, 165   | Gastrin  | 25, 130, 141                               |
| <i>E. coli</i>                                | 81   | Antral   | 12, 13                                     |
| Adherence to microvilli                       | 81   | Cell   | 12, 13, (Fig. 2)                           |
| Electron immunocytochemistry                  | 11   | Distribution   | 12, 132                                    |
| Immunogold staining methods                   | 12, 13 (Fig. 2), 19                                | Intestinal   | 12, 13                                     |
| Glad  | 12   | Molecular forms  | 13, 15, 16 (Fig. 6)                        |
| Gold labelled antibody                        | 12   | Gastrinoma   |  |
| Protein A gold                                | 12, 29 (Fig. 4)                                    | Gastrin, molecular forms in                                      | 15, 18 (Fig. 8), 19                        |
| Monoclonal antibodies                         | 23   | Secretory granules   | 15, 18 (Fig. 8) (Fig. 9)                   |
| Peroxidase-antiperoxidase method              | 11, 12, 13 (Fig. 2)                                | Giant cells  |  |
| Region-specific antisera                      | 13   | Epithelial multinucleate induced by irradiation                  | 114, 115, 118 (Figs 12-14), 75, 78, 79, 91 |
| Endocrine cells                               | 13   | Giardiasis   | 78, 79, 121 (Fig. 16)                      |
| Dysplasia of                                  | 130  | <i>Giardia lamblia</i>   | 78, 79, 122 (Fig. 17)                      |
| Gut   | 25, 88 (Fig. 1)                                    | <i>G. muris</i>  | 78, 79, 122 (Fig. 17)                      |
| Pancreatic                                    | 130  | Glicentin—see enteroglucagon                                     |  |
| Endocrine-paracrine cells                     |  | Glucagon   | 130, 141                                   |
| Actions of                                    | 26   | Molecular form   | 16 (Fig. 6)                                |
| Classification                                | 28   | Pancreatic   | 19, 20 (Fig. 10b), 131, 132                |
| Distribution                                  | 25   | Gluten-sensitive enteropathy                                     | 87   |
| Functional identification of                  | 28   | Non-specific alterations   | 87   |
| Morphology                                    | 26, 27 (Figs 1, 2)                                 | Gluten sensitivity   | 97, 100                                    |
| Endorphins                                    | 32   | Glycocalyx   | 68, 70, 71                                 |
| Endoscopy                                     |  | Goblet cells   | 38, 41 (Fig. 3), 158, 165                  |
| Gastrointestinal                              | 153  | Zinc in  | 42, 44, 47                                 |
| Duodenal                                      | 156  | Gut-associated lymphoid tissue                                   | 93-97                                      |
| Enkephalin                                    | 2 (Table I), 5, 21, 25, 141                        | Cellular features  | 95-97                                      |
| Immunoreactivity in superior cervical ganglia | 8  | Concept  | 93   |
| Enterochromaffin cells                        | 28 (Fig. 3)  | Humoral features   | 95   |
| Enkephalin in                                 | 28   | Gut glucagon—see enteroglucagon                                  |  |
| Substance P in                                | 28   | Gut innervation  | 1  |
| Enterocyte isolation                          |  | $H_2$ -receptor antagonists (see also cimetidine and ranitidine) | 21, 143, 155                               |
| Developmental pattern                         | 184  | Cytological effects on parietal cells                            | 143-153, 156                               |
| EM features                                   | 184 (Figs. 1, 2, 3)                                | Differences between  | 153, 169                                   |
| Fixation                                      | 183  | Hirschsprung's disease   | 112 (Fig. 4)                               |
| Technique                                     | 183  | Histamine  | 8, 143, 155, 156                           |
| Enterocytes                                   | 38, 41 (Figs 2, 3), 115                            | Induced gastric acid secretion                                   | 143, 155                                   |
| Zinc in                                       | 44 (Table VIII), 45                                | Horseradish peroxidase   |  |
| Enteroglucagon                                | 25   | As a diffusion marker  | 75-78                                      |
| Cell  | 20 (Fig. 10a)                                      | 5-hydroxytryptamine  | 25   |
| Glicentin                                     | 15, 16 (Fig. 5), 19, 20 (Fig. 10), 25, 29 (Fig. 4) | Hyperinsulinaemia  |  |
| Gut glucagon                                  | 12, 25   | Pathogenesis of  | 136, 141                                   |
| Molecular forms                               | 16 (Fig. 6)  | Hypersensitivity reactions                                       | 49, 63, 64                                 |
| Secretory granules                            | 20 (Fig. 10a)                                      | Hypoglycaemia hyperinsulinaemic                                  | 130  |
| Epithelial lymphocyte                         |  | I cell—see CCK cell  |  |
| Turnover                                      | 98   | Ileal mucosa   | 65   |
| Experimental models                           | 107  | Adult  | 38   |
| G Cells                                       | 157, 162, 167 (Fig. 9), 169, 172                   | Zinc determinations  | 47   |
| Antral  | 12, 17 (Fig. 2)                                    | Infantile histology  | 66   |
| Hyperplasia                                   | 172  | Crypt enteroblasts   | 66, 67 (Fig. 1)                            |
| In duodenal ulceration                        | 172  | Low-villous enterocytes  | 67 (Fig. 2a)                               |
| Intestinal                                    | 13   | Mid-villous enterocytes  | 67 (Fig. 2b)                               |
| Molecular variants                            | 16 (Fig. 6), 28                                    | Upper-villous enterocytes  | 67 (Fig. 2c), 68, 69                       |
| Secretory granules                            | 13, 14, 17 (Fig. 7)                                | Permeability to macromolecules                                   | 73, 93                                     |
| Gamma-aminobutyric acid                       | 2 (Table I), 25                                    | Immunohistochemistry   | 130, 157                                   |
| Neuronal localisation                         | 6  | Insulin  | 141  |
| Gastric acid secretion                        | 143, 155   | Cells  | 131  |
| Inhibition of                                 | 143, 145, 165, 167                                 | Distribution in pancreatic islets                                | 130, 131                                   |
| Stimulation of                                | 143  | Hypoglycaemia  | 131 (Figs. 1, 2)                           |
| Histamine                                     | 155  |  |  |
| Pentagastrin                                  | 171  |  |  |

- |   |                                  |   |                             |
|---|----------------------------------|---|-----------------------------|
|   | Page                             |   | Page                        |
| Interstitial cells .....                    | 4                                | Oxyntic glands .....                                    | 158 (Fig. 2), 164 (Fig. 7)  |
| Irradiation .....                           |                                  | Effect of cimetidine .....                              | 158 (Fig. 2)                |
| Responses of ileal mucosa .....             | 107                              | Hypertrophy in duodenal ulcer .....                     | 159                         |
| Therapeutic side-effects .....              | 108                              | Oxytocin .....  | 21                          |
| Jejunum .....                               |                                  | P-type nerves .....                                     | 1, 6, 11                    |
| Human .....                                 | 38                               | Classification .....                                    | 21                          |
| Zinc content .....                          | 37, 43                           | Pancreas .....  |                             |
| Kallikreins .....                           |                                  | Islet cell proliferation .....                          | 130                         |
| In argentaffin EC cell carcinoids .....     | 31                               | Morphology of .....                                     | 130, 131                    |
| Kupffer cells .....                         | 93                               | Pancreatic polypeptide .....                            | 2, 25, 130, 132, 141        |
| L cell .....                                | 29 (Fig. 4)                      | Cells in man .....                                      | 132, 133 (Fig. 4)           |
| Distribution .....                          | 12                               | In L cells .....  | 29                          |
| Subclassification .....                     | 12                               | Paneth cells 37, 38, 40 (Fig. 1), 42 (Fig. 4), 158, 165 |                             |
| Lamina propria .....                        | 66, 82, 52 (Fig. 3), 49, 51, 61  | Merocrine secretion .....                               | 47                          |
| (Figs. 14, 15), 119                         |                                  | Zinc content .....                                      | 37, 43, 44, 45              |
| Loud method .....                           | 157                              | Paracrine .....   |                             |
| Luteinizing hormone releasing hormone ..... | 2                                | Regulatory mechanisms .....                             | 129, 141                    |
| Macromolecules .....                        |                                  | Parietal cell .....                                     | 155, 166 (Fig. 8)           |
| Entry into mucosa .....                     | 73                               | Apoptosis of .....                                      | 93, 151                     |
| Absorption .....                            | 74, 77, 78                       | Effect of H <sub>2</sub> -receptor antagonists .....    | 144, 150, 156               |
| Diffusion .....                             | 74-77                            | Secretory cycle .....                                   | 144 (Fig. 1), 145, 173      |
| Mastomy's natalensis .....                  | 32                               | Sensitivity in duodenal ulceration .....                | 155, 171                    |
| Meissner's plexus .....                     | 1, 4                             | Ultrastructure .....                                    | 143, 146, 147 (Fig. 2), 148 |
| Metallothionein .....                       | 46, 47                           | (Fig. 3), 152   |                             |
| Metamide .....                              | 156, 169                         | Pentagastrin .....                                      | 171                         |
| Microvilli .....                            |                                  | Peptidergic nerves .....                                | 6, 25                       |
| In coeliac disease .....                    | 60 (Fig. 12)                     | Co-existence with other neurotransmitters .....         | 8                           |
| Membrane-bound disaccharidases .....        | 72                               | Peptides .....  | 2                           |
| Quantitative studies .....                  | 71                               | see individual entries                                  |                             |
| Migration inhibition factor .....           | 100                              | Peroral biopsy technique .....                          |                             |
| Molecular forms (of peptides) .....         | 11, 13                           | Application of .....                                    | 65                          |
| Variants .....                              | 13                               | Introduction of .....                                   | 65                          |
| Motilin .....                               | 11                               | Peyer's patches .....                                   | 80, 93                      |
| Cell .....                                  | 12, 14 (Fig. 3), 28, 30 (Fig. 5) | M cells .....   | 95                          |
| Multifocal ductoinsular proliferation ..... | 129                              | Pro-glucagon .....                                      | 11, 19                      |
| Myasthenia gravis .....                     | 93                               | see also enteroglucagon, glicentin                      |                             |
| Nesidioblastosis .....                      | 129                              | Pro-hormones .....                                      | 13                          |
| Beta cell .....                             | 129                              | Use of region-specific antisera .....                   | 13                          |
| Definition of .....                         | 129                              | Purinergeric nerves .....                               | 2 (Fig. 1), 3, 6            |
| Of infancy .....                            | 129                              | Uranaffin reaction .....                                | 6                           |
| Nesidiodyplasia .....                       | 129                              | Ranitidine .....  | 143-153, 156, 169           |
| Of infancy .....                            | 129                              | Comparison with cimetidine .....                        | 169                         |
| Neurotensin .....                           | 2, 8, 12, 25                     | Effect on canine parietal cells .....                   | 143-153                     |
| Cell .....                                  | 15 (Fig. 4)                      | Pharmacological activity .....                          | 143                         |
| Neurotransmitters .....                     |                                  | Structure .....   | 143, 156                    |
| Co-existence of .....                       | 3, 6-8                           | Therapeutic use .....                                   | 143, 152, 153               |
| Dale's principle .....                      | 6                                | Regulatory peptides .....                               | 11, 25                      |
| Evidence for .....                          | 7, 8                             | see individual entries                                  |                             |
| Neuronal differentiation .....              | 7 (Fig. 3)                       | Rotavirus .....   | 82, 83                      |
| Criteria .....                              | 1                                | In macrophages .....                                    | 82, 83 (Fig. 2)             |
| Granule profiles .....                      | 3 (Fig. 2), 4, 5                 | In rough endoplasmic reticulum .....                    | 82 (Fig. 21)                |
| Ultrastructural identification of .....     | 1, 4, 5                          | Scanning electron microscopy .....                      | 70, 71 (Fig. 8),            |
| Non-adrenergic component .....              | 2, 181                           | 80 (Fig. 18), 90 (Fig. 2), 92 (Fig. 4)                  |                             |
| Noradrenaline .....                         | 2, 5, 7, 8, 21                   | Review of role .....                                    | 107                         |
| Noradrenergic nerves .....                  | 5, 6                             | Secretin .....  | 25                          |
| Co-existence with peptides .....            | 8                                | Discovery .....   | 11                          |
| Dopamine- $\beta$ -hydroxylase .....        | 6                                | S cell .....  | 12                          |
| Function .....                              | 5                                | Secretory granules .....                                | 11, 167                     |
| Marker for .....                            | 182                              | Sensory nerves .....                                    |                             |
| Use of 6-hydroxydopamine .....              | 26 (Fig. 1), 27                  | In submucous plexus .....                               | 4                           |
| (Fig. 2), 32                                |                                  | Serotonin (see also 5-hydroxytryptamine) .....          | 2                           |
| Ultrastructural appearance .....            | 5, 6, 181                        | Neuronal distribution .....                             | 5, 6                        |
| Synapses .....                              | 31, 32                           | Somatostatin (SRIF) .....                               | 2, 8, 21, 25, 130, 141      |
|   |                                  | Immunoreactive cells .....                              | 131                         |
|   |                                  | In hypoglycaemia .....                                  | 133, 141                    |
|   |                                  | Paracrine effects .....                                 | 172, 173                    |
|   |                                  | SRIF-14 .....   | 157, 165                    |
|   |                                  | SRIF-28 .....   | 157, 165, 168 (Fig. 10)     |



